MEMORANDUM

DATE: January 25, 2023

MEMO TO: Scott Edwards (Municipality of Magnetawan)

COPIES TO: Kerstin Vroom (Municipality of Magnetawan), Tim McBride (Pinchin)

FROM: Sarah Burke (Pinchin)

RE: Magnetawan Waste Disposal Site Methane Monitoring – Fall and Winter 2022

PINCHIN FILE: 225335.006

1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained by the Municipality of Magnetawan (Municipality) to conduct a preliminary methane gas monitoring program to investigate potential methane gas production at the Croft and Chapman Waste Disposal Sites (WDSs) and prepare a report outlining landfill gas (methane) concentrations in comparison to the applicable criteria, as outlined in Ontario Regulation 232/98.

2.0 METHODOLOGY

The 2022 methane monitoring program conducted at the Chapman and Croft WDSs included two rounds of landfill gas monitoring events, one round occurring in the fall of 2022, and the second round occurring in the winter of 2022 (under frozen ground conditions). The fall monitoring event was completed on November 17, 2022, and the winter monitoring event was completed on December 15, 2022. The methane gas monitoring program was completed in accordance with Pinchin's Standard Operation Procedures (SOPs).

2.1 Groundwater Level Measurements

Static groundwater levels were manually measured at the Site during each monitoring event using a Solinst™ water level meter. The water level meter was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse. The water levels were measured in order to determine if the well screens were submerged in order to evaluate whether or not that would have an effect on the gas monitoring results.

2.2 Landfill Gas Monitoring

Landfill gas (methane) monitoring was completed at thirteen (13) monitoring well locations at the Chapman WDS and eleven (11) monitoring well locations at the Croft WDS. Landfill gas measurements were obtained immediately after removing the monitoring well friction fit push-on caps, prior to collecting groundwater level measurements. Monitoring was completed using a GEM 2000 portable gas meter calibrated to detect 100% of the

lower explosive limit (LEL) for methane (CH_4). For landfill gas measurements calibrated for methane, 100% of the LEL is equivalent to 5% volume of methane in air.

3.0 RESULTS

The fall and winter 2022 landfill gas (methane) monitoring results are presented Tables 1 and 2 below for the Chapman and Craft Waste Disposal Sites, respectively.

Table 1: Methane Monitoring Results for the Chapman Waste Disposal Site

Sample Date	Well ID	Screened Interval (masl)	Water Level (m)	Groundwater Elevation (masl)	Methane Concentration (%)
November 17, 2022	BH1	N/A	6.88	307.18	0.5
	BH2	N/A	6.39	307.29	0.5
	BH3-II	319.35 – 316.30	4.68	318.62	0.4
	BH4	N/A	6.03	308.35	0.5
	BH4-II	308.67 – 305.23	6.22	308.39	0.5
	BH5-II	N/A	5.60	286.24	0.5
	BH6-II	N/A	Dry.	N/A	0.5
	BH6-III	289.71 – 286.76	5.01	288.46	0.5
	BH7-II	N/A	Dry.	N/A	0.5
	BH8-I	287.81 – 284.81	4.26	287.46	0.5
	BH9-I	287.63 – 284.55	2.78	289.98	0.5
	BH10-I	312.79 – 309.74	2.34	312.83	0.6
	BH-11	317.54 – 314.46	1.89	318.23	0.4
December 15, 2022	BH1	N/A	6.82	307.24	0.1
	BH2	N/A	6.30	307.38	0.1

	BH3-II	319.35 – 316.30	1.83	321.47	0.1
	BH4	N/A	6.06	308.32	0.2
	BH4-II	308.67 – 305.23	5.84	308.77	0.1
	BH5-II	N/A	4.58	287.26	0.1
	BH6-II	N/A	Dry.	N/A	0.1
	BH6-III	289.71 – 286.76	5.02	288.45	0.1
	BH7-II	N/A	1.91	308.11	0.1
	BH8-I	287.81 – 284.81	4.21	287.51	0.2
	BH9-I	287.63 – 284.55	2.74	290.02	0.1
	BH10-I	312.79 – 309.74	2.25	312.92	0.3
	BH-11	317.54 – 314.46	4.62	315.50	0.0

Table 2: Methane Monitoring Results for the Croft Waste Disposal Site

Sample Date	Well ID	Screened Interval	Water Level (m)	Groundwater Elevation (masl)	Methane Concentration (%)
November 17, 2022	BH1	N/A	1.36	292.46	0.6
	BH8	290.43 – 285.93	3.69	288.78	0.5
	BH9	288.67 – 285.62	1.71	288.73	0.5
	BH10	289.89 – 286.77	1.12	290.71	0.6
	BH11	289.76 – 286.34	2.31	290.3	0.6
	BH12	287.60 – 282.80	1.52	288.35	0.5
	BH13	287.72 – 284.72	4.23	287.34	0.6

	BH14	286.32 – 283.32	1.51	288.75	0.6
	DP7	288.30 – 287.60	1.52	288.25	0.5
	DP8	290.04 – 289.14	Dry.	N/A	0.6
	DP9	289.57 – 288.67	1.15	289.77	0.6
December 15, 2022	BH1	N/A	1.08	292.74	0.2
	BH8	290.43 – 285.93	2.71	289.76	0.1
	BH9	288.67 – 285.62	1.47	288.97	0.1
	BH10	289.89 – 286.77	0.94	290.89	0.1
	BH11	289.76 – 286.34	1.34	291.27	0.2
	BH12	287.60 – 282.80	1.37	288.5	0.2
	BH13	287.72 – 284.72	2.78	288.79	0.1
	BH14	286.32 – 283.32	1.36	288.90	0.1
	DP7	288.30 – 287.60	Dry.	N/A	0.2
	DP8	290.04 – 289.14	1.46	289.6	0.1
	DP9	289.57 – 288.67	Dry.	N/A	0.1

Notes:

1. N/A signifies that no data is available. Borehole logs are not available for Chapman groundwater monitoring wells BH1, BH2, BH4, BH5-II, BH6-II, and BH7-II, and for Croft groundwater monitoring well BH1. Available borehole logs are provided in the attached Appendix I.
2. Shaded data indicates that the well screen is submerged, based on the measured groundwater elevations and screened intervals indicated in the borehole logs. Methane gas measurements in groundwater monitoring wells with submerged screens are not representative of the soil migration methane concentrations.

4.0 FINDINGS

For landfill sites, gas is generated as the waste within the landfill decomposes and varies depending on the stage of decomposition and the characteristics of the waste. Depending on the age and volume of the waste, gas produced at high concentrations may present fire and explosion hazards.

Under Ontario Regulation 232/98, the specified methane concentration limits include:

- Less than 1.0% methane gas in an on-site building, or its foundation;
- Less than 2.5% methane gas in the subsurface at the property boundary; and
- Less than 0.05% methane gas (i.e. not present) in a building, or its foundation, which is located off-site.

Methane concentrations detected at each of the monitoring locations for the Chapman and Croft Waste Disposal Sites during both the fall and winter monitoring events were within the limits specified in O. Reg. 232/98. Methane concentrations measured at the Chapman WDS monitoring wells ranged from 0.0% to 0.6% and at the Croft WDS monitoring wells ranged from 0.1% to 0.6%, which is well below the applicable limit of 2.5% methane gas in the subsurface property boundary. As landfill gas exceedances were not detected at the Sites, there are no explosive concerns related to landfill gas for nearby structures. It is not interpreted that on-going monitoring of methane gas is required for either waste disposal site.

Encl: Appendix I: Borehole Logs

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APPENDIX I

Borehole Logs

Log of Borehole: BH3-II

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 28, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
		Sand Brown sand, some gravel, dry, no PHC odour or staining.		Riser; Bentonite		
10 / 3			3.05			
		Sand and Silt Grey sand and silt, damp, no PHC odour or staining.	3.66		SS1	
		Sand and Silt Grey sand and silt, saturated, no PHC odour or staining.		Screen; Silica Sand	SS2	
20 / 6			6.10			
		End of Borehole				

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive
Suite 203
Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH4-II

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 27, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
		Sand Coarse brown sand, some gravel, dry, no PHC odour or staining.		Riser; Bentonite		
10 / 3			3.05			
		Sand and Gravel Coarse brown sand and gravel, trace cobbles, damp, no PHC odour or staining.			SS1	
13 / 4			3.96			
		Bedrock Bedrock. Auger refusal on assumed bedrock. Sand seam at 20'.		Screen; Silica Sand		
27 / 8			8.44			
		End of Borehole				

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive
Suite 203
Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH6-III

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 28, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
0–10 / 0–3		***Sand and Gravel*** Coarse sand and gravel, some cobbles, damp, no PHC odour or staining.	3.05	Riser; Bentonite		
10–13 / 3–4		***Sand and Gravel*** Coarse sand and gravel, large cobbles, damp, no PHC odour or staining.	3.96		SS1	
13–20 / 4–6		***Bedrock*** Bedrock. Auger refusal on assumed bedrock.	6.30	Screen; Silica Sand		
20 / 6		End of Borehole				

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive

Suite 203

Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH8-I

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 27, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
		Sand Coarse, brown sand with some gravel, no PHC odour or staining.		Riser; Bentonite		
					SS1	
			4.27			
		Sand and Gravel Coarse, brown sand and gravel, trace cobbles, no PHC odour or staining.		Screen; Silica Sand		
					SS2	
			6.05			
		End of Borehole				

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive
Suite 203
Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH9-I

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 28, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
0–13 / 0–4		***Sand*** Coarse brown sand, damp, no PHC odour or staining.	4.27	Riser; Bentonite		
					SS1	
13–26 / 4–8		***Sand and Silt*** Coarse brown sand and fine brown sand and silt, trace gravel, saturated, no PHC odour or staining.			AS1	
		Refusal at 27' on assumed bedrock.	8.23	Screen; Silica Sand	AS2	
		End of Borehole				

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive

Suite 203

Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH10-I

Project #: 225335.001 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 26, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
		Sand Coarse, brown sand, some gravel, trace cobbles, damp, no PHC odour or staining.	1.52	Riser, Bentonite		
		Bedrock Refusal on assumed bedrock.	4.88	Screen, Silica Sand		
		End of Borehole				

ft: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

m: 0 1 2 3 4 5 6 7

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive
Suite 203
Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH11

Project #: 225335 **Logged By:** KM

Project: Hydrogeology Assessment

Client: Municipality of Magnetawan

Location: Chapman Waste Disposal Site, Magnetawan, Ontario

Drill Date: September 26, 2018 **Project Manager:** TM

SUBSURFACE PROFILE					SAMPLE	
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sample #	Recovery (%)
0 / 0		Ground Surface	0.00			
0–3 / 0–1		***Sand and Silt*** Brown sand with silt, damp, no PHC odour or staining.		Riser; Bentonite	SS1	
10–16 / 3–5		***Sand*** Coarse, brown sand, saturated, no PHC odour or staining.	3.05	Screen; Silica Sand	SS2 AS1	
16 / 5		End of Borehole	4.88			

Contractor: CCC

Drilling Method: Hollow Auger

Well Casing Size: 5.08 cm

957 Cambrian Heights Drive
Suite 203
Sudbury, ON P3C 5S5

Grade Elevation: NA

Top of Casing Elevation: NA

Sheet: 1 of 1

BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: DP7 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Hand Auger **Contractor:** N/A	**DATE:** June 9, 2015 **LOGGED BY** TLC/SRB **GROUND ELEV** 289.30 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	N VALUE	% WATER	% REC	% RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
0.3 289.0		**TOPSOIL** Dark brown to black, silty topsoil, trace to some sand, occasional rootlets, moist becoming saturated below about 0.2 m.		1		GS						
				2		GS						
0.5 288.8		**SAND** Brown to grey fine to medium sand, trace fine gravel, trace silt, saturated. -Changing to a silty fine sand with occasional fine gravel and cobles below about 0.4 m.		3		GS						
1				4		GS						
		SANDY SILT TILL Brown to grey silty sand to sandy silt till, brown oxidation observed, trace fiine gravel, moist to wet, dense. -Hand auger refusal in dense till at about 0.8 m										
1.7 287.6		Borehole teminated at 1.72 m in assumed till due to drive point refusal on assumed bedrock.										

Printed: Jan 15, 16
File Location:

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: DP8 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Hand Auger **Contractor:** N/A	**DATE:** June 9, 2015 **LOGGED BY** TLC/SRB **GROUND ELEV** 290.54 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	N VALUE	% WATER	% REC	% RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
0.2 290.3		**TOPSOIL** Dark brown to black, silty topsoil, trace to some sand, occasional rootlets, moist.		1		GS						
				2		GS						
		SAND Brown to grey fine to medium sand, trace fine gravel, trace silt, wet. -Becoming saturated below about 0.4 m. -Changing to a silty fine sand with trace fine gravel below about 0.5 m. -Hand auger refusal in dense soil at about 0.9 m		3		GS						
				4		GS						
				5		GS						
				6		GS						
1				7		GS						
1.4 289.1		Borehole teminated at 1.41 m in assumed silty sand due to drive point refusal on assumed bedrock.										

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: DP9 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Hand Auger **Contractor:** N/A	**DATE:** June 9, 2015 **LOGGED BY** TLC/SRB **GROUND ELEV** 289.97 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
0.2 289.8		**TOPSOIL** Dark brown to black, silty topsoil, trace to some sand, occasional rootlets, saturated.		1		GS						
		SAND Grey fine to medium sand, trace fine gravel, trace silt, saturated.		2		GS						
		-Changing to a medium sand with trace fine sand below about 0.7 m.		3		GS						
1		-Grey silty sand noted below about 0.9 m.		4		GS						
		-Hand auger refusal in dense soil at about 1.0 m.		5		GS						
1.3 288.7		Borehole teminated at 1.27 m in assumed silty fine sand.		6		GS						

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: BH8 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Auger/Coring **Contractor:** pontil drilling	**DATE:** June 22, 2015 **LOGGED BY** SRB **GROUND ELEV** 291.63 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
0.2 291.5		**TOPSOIL** Dark brown, silty topsoil, trace to some sand, trace rootlets, moist.		1		SS	9					
		SAND Brown fine to medium sand, trace coarse sand and fine to medium gravel, moist.		2		SS	8/0.23m					
1.0 290.6		**GNEISSIC BEDROCK** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineralization, massive.		3		HQ			100	100		
				4		HQ			100	100		
				5		HQ			100	100		
				6		HQ			100	92		
				7		HQ			100	92		
5.7 285.9		Borehole terminated at 5.72 m in Gniessic Bedrock.										

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: BH9 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Auger/Coring **Contractor:** pontil drilling	**DATE:** June 22, 2015 **LOGGED BY** SRB **GROUND ELEV** 289.52 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
		SAND Brown fine to medium sand, some fine gravel, wet. -0.15 m layer of brown to grey silty fine sand, trace gravel at about 0.2 m.		1		SS	4					
				2		SS	31					
1		-0.15 m layer of medium to coarse sand, some gravel, saturated, at bedrock contact.										
1.4 288.2		**GNEISSIC BEDROCK** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineralization, massive.		3		HQ			100	100		
2												
3				4		HQ			100	100		
				5		HQ			100	100		
3.9 285.6		Borehole terminated at 3.89 m in Gniessic Bedrock.										

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: BH10 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Auger/Coring **Contractor:** pontil drilling	**DATE:** June 23, 2015 **LOGGED BY** SRB **GROUND ELEV** 290.87 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
0.2 290.7		**TOPSOIL** Dark brown, silty topsoil, trace to some sand, trace rootlets, moist.		1		SS	0					
		SAND Brown silty sand, trace fine gravel, moist. -Becoming fine sand and saturated below about 0.76 m -Changing to a fine to medium sand below about 0.9 m.		2		SS	23					
1												
				3		SS	21					
2												
2.1 288.7		**GNEISSIC BEDROCK** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineralization, massive.		4 5		HQ HQ			100 100			
3				6		HQ			100			
4.1 286.8	4	Borehole terminated at 4.06 m in Gniessic Bedrock.										

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File Location:

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BOREHOLE LOG	PROJECT: 60336434	BOREHOLE: BH11 1 of 1
Subsurface Investigation Croft Landfill **Client:** Township of Magnetawan	**Northing:** N/A **Easting:** N/A **Methodology:** Auger/Coring **Contractor:** pontil drilling	**DATE:** June 24, 2015 **LOGGED BY** JNB **GROUND ELEV** 290.74 m ASL

DEPTH (m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	RECOVERY (%) 25 50 75 100	RQD (%) 25 50 75 100
		GNEISSIC BEDROCK Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineralization, massive.		1		HQ			100			
1				2		HQ			100			
2												
3				3		HQ			100			
4												
4.4 286.4		Borehole terminated at 4.39 m in Gniessic Bedrock.										

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File Location:

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Log of Borehole: BH12

Project #: 225335.005 **Logged By:** TG

Project: Groundwater Monitoring Well Installation

Client: The Corporation of the Municipality of Magnetawan

Location: Croft Waste Disposal Site, Magnetawan, Ontario

Drill Date: April 21, 2020 **Sheet:** 1 of 1

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	0.00					
0–20 / 0–6		***Gneissic Bedrock*** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineral, ization, massive		Riser; Bentonite; Silica Sand; Screen	100	RC1		
					100	RC2		
					100	RC3		
					100	RC4		
20 / 6		End of Borehole	-6.10					

Contractor: Marathon Underground Constructors Corporation

Grade Elevation: 288.896 mREL

Drilling Method: HQ Diamond Core Bit

Top of Casing Elevation: 289.866 mREL

Well Casing Size: 5.08 cm

UTM Coordinates: 17T 593608mE 5058582 mN

Log of Borehole: BH13

Project #: 225335.005 **Logged By:** TG

Project: Groundwater Monitoring Well Installation

Client: The Corporation of the Municipality of Magnetawan

Location: Croft Waste Disposal Site, Magnetawan, Ontario

Drill Date: April 22, 2020 **Sheet:** 1 of 1

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	0.00					
0–20 / 0–6		***Gneissic Bedrock*** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineral, ization, massive		Riser; Bentonite; Silica Sand; Screen	100	RC1		
					100	RC2		
					100	RC3		
					100	RC4		
20 / 6		End of Borehole	-6.10					

Contractor: Marathon Underground Constructors Corporation

Grade Elevation: 290.821 mREL

Drilling Method: HQ Diamond Core Bit

Top of Casing Elevation: 291.566 mREL

Well Casing Size: 5.08 cm

UTM Coordinates: 17T 593714 mE 5058508 mN

Log of Borehole: BH14

Project #: 225335.005 **Logged By:** TG

Project: Groundwater Monitoring Well Installation

Client: The Corporation of the Municipality of Magnetawan

Location: Croft Waste Disposal Site, Magnetawan, Ontario

Drill Date: April 22, 2020 **Sheet:** 1 of 1

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	0.00					
0–20 / 0–6		***Gneissic Bedrock*** Grey to black metamorphic bedrock, some quartzite and biotite with garnet mineral, ization, massive		Riser; Bentonite; Silica Sand; Screen	100	RC1		
					100	RC2		
					100	RC3		
					100	RC4		
20 / 6		End of Borehole	-6.10					

Contractor: Marathon Underground Constructors Corporation

Grade Elevation: 289.416 mREL

Drilling Method: HQ Diamond Core Bit

Top of Casing Elevation: 290.259 mREL

Well Casing Size: 5.08 cm

UTM Coordinates: 17T 593733 mE 5058558 mN